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## THE DISTRIBUTION OF THE PIKAS (*OCHOTONA*) IN BRITISH COLUMBIA AND ALBERTA

I. McT. COWAN

An examination of a large series of specimens representing the genus *Ochotona* in British Columbia and western Alberta has served to change existing concepts of the distribution of the several subspecies there and has revealed the existence of two undescribed races.

The physiography of British Columbia is dominated by a series of mountain ranges, running in a generally northeast-southwest direction and paralleling each other. The Coast Range follows the coastline throughout the length of the Province. The Rocky Mountains follow the Alberta-British Columbia boundary from the 49th parallel to the 53rd parallel and then continue northwesterly to the valley of the Liard River. There are several ecological gaps in the range notably where the Peace River passes through it. Here the Peace River drains a large low-elevation plateau that is continuous at its westerly extremity with the Skeena River drainage basin and together they effectively partition the alpine environment into Northern and Southern divisions, referred to elsewhere (Munro & Cowan, 1947) as Northern and Southern alplands. *Ochotona collaris* is restricted in its range to the northern alplands and no other form of *Ochotona* occurs there.

In the southern part of the province several minor mountainous areas, particularly the Monashee and Selkirk ranges, are interposed between the Coast and Rocky Mountain ranges. The effect of these mountains placed athwart the main air drift off the Pacific Ocean, is to give rise to a series of alternating moist and dry climatic areas. These are vegetated accordingly and a number of species of mammals show variation that results in dark races inhabiting the humid areas, pallid races the adjacent dry regions. In most cases the external differences are accompanied by changes in proportions of the external features and skull. *Ochotona* is among the most sensitive to the influences associated with the humidity of its environment and has given rise to several indigenous races that follow this general formula.

The western slope of the Rocky Mountains south of latitude 54° N. is inhabited by a grayish race in which the winter pelage is faintly washed with yellowish brown both dorsally and ventrally. This race *Ochotona princeps princeps* (Richardson) extends south into Montana where it appears to inhabit the easterly as well as the westerly slope of the mountains. Another subspecies *Ochotona p. levis* (Hollister) has been described from the Waterton Lakes area but in my opinion the differences ascribed to this population are so elusive as to be unsubstantial. The race *levis* then, is regarded as synonymous with *princeps*. There are indications that the range of *princeps* is now discontinuous, and that it is broken in the region of Kickinghorse Pass by an intrusive population with many of the characteristics of the small, even more pallid subspecies *O. p. lutescens* (Howell) from the eastern aspect of the Rocky Mountains.

The situation here has been well described by Crowe (1943), who pointed out that within the southern part of Banff National Park and the adjacent parts of British Columbia the pikas showed strong influence of the small pallid strain known as *lutescens*. He further pointed out that the population did not show true intermediacy but rather revealed the characteristics of *princeps* and *lutescens* in various combinations.

I have not examined the specimens from the Bitterroot Mountains of Idaho, ascribed by Davis (1939) to the race *princeps*, but the distribution of pikas in the adjacent region of British Columbia leads me to suspect that *O. p.*

*cuppes* rather than *princeps* is the race inhabiting the mountains of northern Idaho.

*Ochotona princeps lutescens* (Howell) is the smallest, palest and grayest of the Canadian races of *princeps*. It is still known only from a restricted area on the eastern face of the Rocky Mountains north of the 51st parallel of latitude. As explained above, however, the influence of characteristics combined in this race extends over an area across the range at that latitude. How far north and south its range extends is not known, but one specimen from Sunwapta Pass bears strong resemblance to it. During extensive travels through the eastern part of the Rocky Mountains between 1943 and 1946 pikas were seldom noted but a special search might reveal *lutescens* to have a wider range than the relatively limited area in Banff Park from which it is now known.

An extensive mountainous area 150 miles long and up to 75 miles wide is enclosed between the Fraser River and the Thompson and North Thompson rivers. The bounding valleys are generally broad and constitute barriers to the distribution of *Ochotona*. From this area there are but two collections of pikas. McCabe obtained a series of 14 specimens from Indianpoint Lake that were referred by Hall (1934) to the race *O. p. princeps*. These are intermediate in their characters between *princeps* and the next mentioned population. More recently specimens taken in the vicinity of Myrtle Lake, Wells Gray Provincial Park were presented to the Museum of Zoology by P. W. Martin. These prove to be quite unlike *princeps*, and represent the darkest, most saturate race east of the humid forest region of the immediate coast of the province. This dark color is associated here also with a region of high humidity. In body color some of the Myrtle Lake specimens can be matched in the series of *brunescens* from the west slope of the Coast Range, except that they are generally grayer, but some cranial characteristics are distinctive and the animals are smaller in size. They are regarded as representing an undescribed subspecies that is named below as *Ochotona princeps saturatus*.

The Selkirks, south of the northern loop of the Columbia River, and the Monashee Range are inhabited by *O. p. cuppes*, a yellowish brown subspecies in which the underparts are often strongly suffused with bright cinnamon. The population in the mountains north of the Illicillewaet River shows some approach toward *princeps*.

Between the Monashee Mountains and the Fraser River, south of the Thompson and South Thompson rivers there is an extensive plateau area with little mountainous relief except in the west. It is a region of *Ponderosa* pine-Douglas fir forests of open growth with some *Pinus contorta* and *Picea engelmannii* at higher elevations and on northern slopes. It is quite unlike the terrain occupied by *Ochotona* elsewhere in the province. There are, however, scattered populations of pikas in railway embankments and in small rock slides often isolated from each other by miles of timber or grassland.

This area is occupied by the race described as *Ochotona princeps brooksi* (Howell), the most brightly colored of all the races inhabiting British Columbia. Howell (1924) identified as of this race, specimens from Lillooet and elsewhere along the eastern face of the Cascade Range. This misidentification resulted largely from the small number of topotypes of *fenisex* available to him. The larger series now available reveals this race as of greater dimensions than Howell had believed and with distinctive color and cranial features.

The explorations conducted along the mainland coast of British Columbia by the National Museum of Canada led to the collection of large series of *Ochotona* from the heads of some of the deepest inlets and from the eastern face of the Coast Range. Included also were smaller series of the pika inhabiting the rain-drenched, moss-clothed, talus slopes that tumble from the precipitous coastal face of the range into the sea.

The specimens from Stuie, Kimsquit and the Rainbow and Caribou mountains are indistinguishable from topotype *fenisex* and the range of this race is thereby extended far to the northwest of its previously known limits.

*New subspecies—*

The specimens from the coastal slope north of Bute Inlet prove to represent an undescribed subspecies that may be known as

*Ochotona princeps littoralis* ssp. nov.

*Type*—Adult male, skin and skull, Number 15825, National Museum of Canada, taken at Hagensborg, B. C., July 6, 1938, by C. J. Guiguet.

*Distribution*—The coastal slope of the Coast Range mountains of British Columbia from the Bella Coola Valley south to Bute Inlet, interrupted at the heads of certain of the deepest inlets by local populations showing the results of gene flow down the river valleys from the eastern side of the range. The population southward as far as Black Mountain immediately north of Vancouver shows the saturate characteristics in high degree and could be included within this form, although possessing some characteristics of *O. p. brunnescens*.

*Diagnosis—*

The darkest of all the Canadian races, upper parts including head uniformly dark brown heavily overlaid with black, somewhat darker on rump. Underparts buff basally but in most specimens hairs are banded with black to give a generally darker hue. Patches below ears reddish brown. No pale post-auricular spot (1 exception). This characteristic is particularly obvious also in the young. No qualitative cranial characteristics distinguish it from adjacent races.

*Measurements*—Means and extremes of 12 adult males. Total length 208.5 (193-216); tail 18.7 (18-20); hind foot 33.7 (32-35). Cranial measurements are given on the accompanying table of comparisons.

*Comparisons*—The newly described race requires comparison with the race *fenisex* occupying the contiguous area east of the Coast Range and with *brunnescens*, the race inhabiting the coastal slope of that range to the south. As has been mentioned above, the most obvious characteristic of *littoralis* is its very dark pigmentation. This is particularly obvious in comparison with the pallid race *fenisex* but is quite striking in a comparison of series of *littoralis* and *brunnescens*. The palest specimens of the new race are indistinguishable from the darkest specimens of *brunnescens*, but the body of the majority is much darker, with the general effect fuscous rather than brown. *O. p. littoralis* differs further from *brunnescens*, in significant degree ( $P=.01$ ) in the following respects. Condylbasal length greater, least interorbital width less.

From *fenisex*, *littoralis* differs significantly in having condylbasal length, zygomatic width, length of nasals, and height of skull above posterior molars greater.

*Remarks*—At the head of Rivers Inlet there occurs a population, represented by 3 specimens in the National Museum of Canada, that is indistinguishable in color from *brunnescens*. The skulls are badly broken but in condylbasal length they fall unequivocally with *littoralis*.

Two alternative explanations for the characteristics of this population exist. It may represent the northern extremity of the range of *brunnescens*. Alternatively it seems probable that the combination of characteristics possessed by *fenisex* and *saturatus* would give rise to those of the Rivers Inlet specimens. The river valley cutting through the mountains from the east side (*fenisex* range) to the sea (*littoralis* range) offers an easy opportunity for gene flow from one population to the other. In light of present knowledge the second alternative is favoured.



The dark colored form from the mountains of Wells Gray Park can be known as:

*Ochotona princeps saturatus* ssp. nov.

*Type specimen*—Female adult, skin and skull, number 3218, Museum of Zoology, University of British Columbia. Taken on Mount Huntley in Wells Gray Park, B. C., on June 20, 1950, by P. W. Martin.

*Distribution*—Known only from the mountains of Wells Gray Park (52° N, 120° W) but probably inhabiting the entire Cariboo Mountain Range.

*Diagnosis*—A dark, grayish brown race, most like *brunnescens* in body color but averaging less brownish. Occasional specimens of the two races are indistinguishable in color but differ in the small body size of *saturatus*. Skull large with broad nasals.

*Measurements*—Means and extreme of six adults total length  $194.5 \pm 3.88$  (175-204), hind foot  $32 \pm .372$  (31-34).

*Comparisons*—This race is easily distinguishable from *O. princeps princeps* by its much darker color. The other races occupying approximately contiguous ranges are *brooksi* and *fenisex*. From both of these *saturatus* differs in darker color. From *fenisex* it differs further in having longer nasals, broader occiput and interorbital region and shorter hind foot. From *brooksi* the new race differs in having total length, and upper molar row shorter.

*Discussion*—Other systematists, in studying the North American *Ochotona* have commented upon the conservatism of the genus in cranial dimensions. Subspecific differences occur in the size of the bulla, the architecture of the palatal bridge and post palatal fossa and the shape of the nasals, but apart from these the skull form varies little. Table 1 reveals this situation for 5 populations, some of them isolated from others by hundreds of miles and insuperable barriers to their distribution. In view of this situation the almost precise agreement between the mean values for the same dimensions in 2 or more of the population is noteworthy.

It should be noted also that in such features as zygomatic width, interorbital width, and length of upper molar row, there is a tendency for the means to fall precisely on one of two values. Thus zygomatic width is 22.6 mm. in *littoralis*, *brunnescens* and *brooksi*; 22.0 and 21.8 in *saturatus* and *fenisex*. Interorbital width is 5.0 mm. in *littoralis* and *fenisex*, 5.8 mm. in *brunnescens*, *saturatus* and *brooksi*. The figures have been re-examined to rule out the possibility of artefact, and the random assortment involving several features makes accidental coincidence unlikely. It is as if, at the population level, certain quantitative features were inherited as unit characters.

#### Specimens examined:

*Ochotona princeps brooksi*. Near Sicamous 4, Tappen 8, Robbins Range near Kamloops 1.

*Ochotona princeps brunnescens*. Alta Lake and vicinity 43, N. Vancouver 5, 9 miles east of Hope 1.

*Ochotona princeps cuppes*. Toby Creek, 18 miles west of Invermere 11, Phoenix 2, Kettle Valley 1, 20 miles east of Sugar Lake 1, Monashee Pass 21, Mt. Revelstoke (resembles *princeps*) 6, Morrissey 1 (resembles *princeps*).

*Ochotona princeps fenisex*. Cathedral Lake 1, Ashnola River 1, Manning Park Headquarters 7, Texas Creek 6, McGillivray Creek 5, 24 miles west of Williams Lake 5, Hanceville 3, Redstone 1, Kleena Kleene 2, Kimsquist 14, Stuie 10, Rainbow Mts. 11, Caribou Mt. 8.

*Ochotona princeps littoralis*. Hagensborg 12, Fawn Bluff on Bute Inlet 11, Arran Rapids on Bute Inlet 1, Purcell Point on Bute Inlet 1. Head of Rivers Inlet (intergrades) 3.

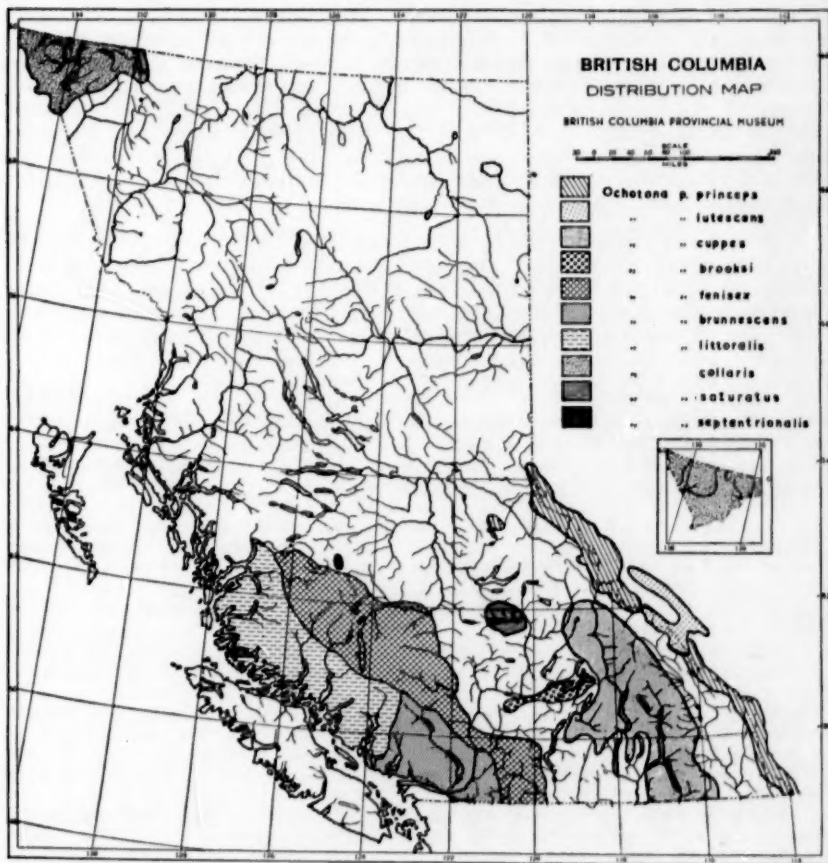
*Ochotona princeps lutescens*. Banff National Park; Mt. Inglesmaldie 3, Head of Stony Creek 1, Head of Brewster Creek 1, Head of Dormer R. 2.

*Ochotona princeps princeps*. Jasper Park, Alberta. Medicine Lake 1, Emigrants Mt. 2, Tonquin Valley 10, Yellowhead Pass 1, Maynard Pass 2, Mt. Edith Cavell 1, Sunwapta Pass 1.

Banff National Park, Alberta: Pipestone River 1, Baker Lake 1, Thompson Pass 3. Waterton Lakes Park, Waterton Lake 3. British Columbia: Yellowhead Pass 1, Sherbrooke Lake 3, Mt. Stephen, Field 4, Kinbasket Lake 2, Sullivan River near Kinbasket Lake 1, Mt. Rowe 3, Indian Point Lake 4.

*Ochotona princeps septentrionalis*. Itche Mts. ( $53^{\circ}$  N,  $125^{\circ}$  W) 2.

*Ochotona princeps saturatus*. Mt. Huntley, Wells Gray Park 2, Myrtle Lake, Wells Gray Park 4.



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## BIRDS OBSERVED IN THE POTHOLES REGION DURING 1953-1954

PAUL A. JOHNSGARD

From June 15-August 15, 1953 and from February 15 to August 15, 1954 the writer did extensive field work in the Potholes Region of Grant County, Washington, gathering data for an ecological study of the vegetation and wildlife of that area. During this time considerable observations of the bird life were made, which for the most part were restricted to the area adjacent to O'Sullivan Dam and Potholes Reservoir.

O'Sullivan Dam is a U. S. B. R. dam which has been constructed across the Drumheller scabland channel, the southernmost outlet for the glacial waters which were once impounded in Quincy Basin (Bretz, 1928). The debris deposited during this Pleistocene impoundment are the origin of an extensive area of sand dunes which characterize the region. Between these dunes are located the "potholes," which under original conditions supported a wide variety of plant and animal life. With the construction of O'Sullivan Dam and the resulting impoundment many of these potholes have been inundated and the water levels of those remaining have been greatly affected. For this reason the Potholes Region has been the subject of recent research in an attempt to determine and evaluate these changes as they affect wildlife.

Harris and Yocom (1952) have summarized records of 168 species of birds observed in this area and throughout the lower Grand Coulee. To avoid reiterating these published records the present paper only lists 145 species observed by the writer or other observers during the two years under consideration, nine of which are not included in the previous list (Harris and Yocom, 1952).

Scientific names used are those given by Hudson and Yocom (1954), based on specimens taken in southeastern Washington. Additional sight records were contributed by Allen J. Greene, U. S. Fish and Wildlife Service; Robert Braunwart, Washington Game Department; Irven O. Buss, Washington State College, and George E. Hudson, Washington State College.

Lesser Common Loon (*Gavia immer elasson*). Uncommon migrant, four records in 1953, from October 15 to December 19. Three spring records, May 3-7, 1954. All observations are for single birds on Potholes Reservoir except one seen July 5, 1954 below O'Sullivan Dam on a small seepage lake (Greene).

American Horned Grebe (*Colymbus auritus cornutus*). A single record, one bird on Potholes Reservoir April 14, 1954.

Eared Grebe (*Colymbus caspicus californicus*). Abundant migrant, no nesting observed on Potholes Reservoir. Early record March 23, 1954, peak numbers of 112 observed May 7. A few June and July records.

Western Grebe (*Aechmophorus occidentalis*). Common summer resident on Potholes Reservoir and Moses Lake. Observed March 29, 1954 on Moses Lake (Braunwart), first noted on Potholes Reservoir April 14. Courtship observed April 25 and June 12, 1954. At least 52 were present on Potholes Reservoir the summer of 1953; young (1/3 grown) first noted August 9. Late departure December 5.

Pied-billed Grebe (*Podilymbus podiceps podiceps*). Common summer resident in the potholes, first noted February 16, 1954, possibly wintered.

White Pelican (*Pelecanus erythrorhynchos*). Common summer resident on Potholes Reservoir and Moses Lake. Previously (Brown, 1926) a nesting bird on Moses Lake, no indication of present nesting found. Early arrival 1953 (Greene) February 28; observed on Potholes Reservoir February 18, 1954. Late departure October 23.

Double-crested Cormorant (*Phalacrocorax auritus*). Apparently a fairly common migrant in recent years. Brown (1926) observed it at Moses Lake; Greene observed a single bird on Potholes Reservoir in 1952. Seven 1953 records from July 10 to October 23. Four 1954 records from April 22 (14 birds) to May 3.

Great Blue Heron (*Ardea herodias herodias*). Permanent resident, uncommon in winter. Nests at Moses Lake, where numerous young were observed June 19, 1954.



American Egret (*Casmerodius albus egretta*). Rare, two records. A single bird observed July 10 and 16, 1953 along Crab Creek.

Black-crowned Night Heron (*Nycticorax nycticorax hoactli*). Common summer resident in the potholes and Moses Lake. No nests found or young seen. Yocom (Hudson and Yocom, 1954) found a colony on Moses Lake. Early arrival March 28, 1954. Late departure October 15, 1953.

American Bittern (*Botaurus lentiginosus*). Uncommon summer resident and breeder in the potholes. Early arrival May 4, 1954, nest with eggs June 11-17, 1954. Late departure October 3.

Whistling Swan (*Olor columbianus*). Uncommon migrant. Early arrival February 15, 1954, late spring departure May 30, 1954. Maximum numbers of 13 recorded April 12 (Greene).

Canada Goose (includes *Branta canadensis moffitti* and *B. c. leucopareia*). Common permanent resident. Spring migration peak mid-February 1954. Nests throughout the area, on Moses Lake, Potholes Reservoir and Halfmoon Lake in the Drumheller scabland channels.

Lesser Snow Goose (*Chen hyperborea hyperborea*). Uncommon migrant. Three fall records, October 15 to October 31, 1953. Six spring records from April 12 to June 9, 1954; maximum numbers of 41 observed May 13.

Common Mallard (*Anas platyrhynchos platyrhynchos*). Abundant permanent resident and breeder. Migration peak mid-February 1954.

Gadwall (*Anas strepera*). Common breeder, a few wintering in 1953-54. Migration peak latter April, 1954.

Baldpate (*Mareca americana*). Local resident and breeder, wintering in moderate numbers in 1953-54. Several broods produced in the Drumheller region (Greene), one observed in the potholes. Migration peak March, mid-April 1954.

American Pintail (*Anas acuta tzitzihua*). Common migrant and uncommon breeder, a few wintering in 1953-54 (Greene). Migration peak March, 1954.

Green-winged Teal (*Anas carolinensis*). Common resident and breeder, a few wintering in 1953-54 (Greene). Spring migration peak latter April, 1954.

Blue-winged Teal (*Anas discors*). Very common migrant and breeder. Early arrival April 29, 1954. Spring migration peak late May, 1954, late departure for this or the following species October 15, 1953.

Northern Cinnamon Teal (*Anas cyanoptera septentrionalium*). Common migrant and breeder, much less common in this area than the preceding species. Early arrival April 10, 1954, spring migration peak latter May.

Shoveller (*Spatula clypeata*). Common migrant; a few remaining to nest in the area. A small number wintered in 1953-54 (Greene), spring migration peak late April, 1954.

Wood Duck (*Aix sponsa*). Rare migrant and summer resident. Early arrival May 10, 1954 (Greene). Five summer records, July 10-August 13, 1953 of up to three birds. One female in moult observed in the potholes. No nesting records for the area.

Redhead (*Aythya americana*). Common migrant and local breeder; a single bird wintered in the area in 1953-54 (Greene). Thirteen were observed on February 15, 1954. Spring migration peak latter April, 1954.

Ring-necked Duck (*Aythya collaris*). Common migrant, a few wintering in 1953-54 (Greene). Migration peak third week of April, 1954. Late spring departure May 29, 1954. One summer record, July 18, 1953.

Canvasback (*Aythya valisineria*). Common migrant, a few wintering in 1953-54 (Greene). Spring migration peak late February, 1954. Late spring departure May 6. One July record for Potholes Reservoir; a male was present on Morgan Lake in the Drumheller channels most of the summer of 1954.

Lesser Scaup Duck (*Aythya affinis*). Common migrant, not breeding in this area. A moderate number wintered in the area in 1953-54 (Greene), spring migration peak late March and April, 1954. Late spring departure May 14. Several June, July and August records for Potholes Reservoir.

American Goldeneye (*Bucephala clangula americana*). Common migrant, wintering in moderate numbers in 1953-54 (Greene). Late spring departure May 7, 1954. Early fall arrival October 31, 1953.

Barrow's Goldeneye (*Bucephala islandica*). Uncommon migrant in this area, nesting at Lake Lenore and vicinity. Early spring arrival March 16, 1954 (Greene) at Lake Lenore, late spring departure May 28, 1954. One male on Morgan Lake during the summer of 1954.

Bufflehead (*Bucephala albeola*). Common migrant, a very few birds wintering in the area in 1953-54 (Greene). Peak of spring migration late April, 1954. Late spring departure May 25, early fall arrival October 3, 1953. A few summer records.

Ruddy Duck (*Oxyura jamaicensis rubida*). Abundant migrant and uncommon breeder

in the potholes. A few birds were present most of the winter of 1953-54 (Greene), spring migration peak latter April and early May, 1954.

Hooded Merganser (*Lophodytes cucullatus*). Rare migrant and summer resident, no known nesting in this area. Eight spring records, early arrival February 15, 1954, late departure May 13. Six summer records in 1953, from July 23 to August 13, mostly on Crab Creek, where several were observed feeding on salamanders (*Amblystoma tigrum*).

American Merganser (*Mergus merganser americanus*). Common resident, no known nesting in this area. Present most of the winter of 1953-54 (Greene), peak of spring migration mid-February, 1954. A small number remained on Potholes Reservoir through the summer of 1954. Early fall arrival November 22, 1953.

Western Red-tailed Hawk (*Buteo jamaicensis calurus*). Common resident in the Drumheller scabland channels, nesting. No nesting observed in the potholes.

Swainson's Hawk (*Buteo swainsoni*). Common summer resident and breeder in the potholes. Early arrival April 14, 1954.

American Rough-legged Hawk (*Buteo lagopus s. johannis*). Winter visitor throughout the region. Latest record March 15, 1954.

Ferruginous Rough-leg Hawk (*Buteo regalis*). Migrant and summer resident in the sagebrush areas, not observed in the potholes.

Golden Eagle (*Aquila chrysaetos canadensis*). Two records, February 26, 1954, one adult; and March 26, a sub-adult and juvenile. Allen Greene has recorded the species once.

Northern Bald Eagle (*Haliaeetus leucocephalus washingtonii*). Uncommon during 1953-54. Recorded October 3 and 15, 1953, and four spring records from February 21 to March 11, 1954.

Marsh Hawk (*Circus cyaneus hudsonius*). Common resident throughout the area.

Osprey (*Pandion haliaetus carolinensis*). Rare migrant. Observed September 19, 1953; April 19 and May 6, 1954.

Prairie Falcon (*Falco mexicanus*). Permanent resident in the area, three records April 28 to October 31.

Duck Hawk (*Falco peregrinus anatum*). Rare, two records: April 20, 1954 and August 4, 1953.

Eastern Sparrow Hawk (*Falco sparverius sparverius*). Common resident and breeder in the Drumheller scabland channels.

European Partridge (*Perdix perdix*). Introduced, resident and breeder in sagebrush and cultivated areas.

Chukar Partridge (*Alectoris graeca*). Introduced; 175 released in the area below O'Sullivan Dam during February and March, 1954.

Arizona Scaled Quail (*Callipepla squamata pallida*). Introduced, now very rare. Two observed April 26, 1954 near Corfu (Greene) and two seen near Hampton Lake, 4 miles south of O'Sullivan Dam, August 7, 1954 (Buss).

Ring-necked Pheasant (*Phasianus colchicus*). Introduced; breeds in the potholes, sagebrush and on the irrigated areas.

Sandhill Crane (*Grus canadensis*). Uncommon migrant. Early arrival April 12, 1954. Late spring departure April 29 (Braunwart).

Virginia Rail (*Rallus limicola limicola*). Summer resident and breeder in the potholes. Early record May 30, 1954.

Sora (*Porzana carolina*). Common summer resident and breeder in the potholes. Early arrival April 29, 1954. Three nests with eggs and/or downy young from July 10 to July 24, 1953.

American Coot (*Fulica americana americana*). Abundant migrant and breeder in the potholes. Several hundred wintered in 1953-54. Spring migration peak latter April, 1954. Nests with eggs from May 17-July 9, 1954.

Semipalmated Plover (*Charadrius hiaticula semipalmatus*). Three records, July 26 (two birds), August 2 (one bird) and August 7 (three seen by I. O. Buss), 1954.

Killdeer (*Charadrius vociferus vociferus*). Abundant resident and breeder. Early record February 15, 1954, possibly wintering. Downy young observed from May 6 to August 7, 1954.

Wilson's Snipe (*Capella gallinago delicata*). Common migrant, rare summer resident in the potholes. Early arrival, February 15 (14 birds), 1954. Late departure October 31, 1953.

Northern Long-billed Curlew (*Numenius americanus parvus*). Only two records: two observed June 8 and one on August 4, 1954.

Spotted Sandpiper (*Actitis macularia*). Common summer resident, breeding in the potholes. Early arrival May 7, 1954. Downy young seen from July 26 to August 2, 1954.

Western Solitary Sandpiper (*Tringa solitaria cinnamomea*). Uncommon migrant; early arrival April 27, 1954; late spring departure May 3, 1954. Early fall arrival July 5, 1954, July 9, 1954.

Greater Yellow-legs (*Totanus melanoleucus*). Uncommon migrant; early spring arrival April 14, 1954; late spring departure May 5. Early fall arrival June 28, 1953, June 30, 1954. Late fall departure October 31, 1954.

Lesser Yellow-legs (*Totanus flavipes*). Uncommon migrant; early spring arrival April 10, 1954; late spring departure May 4, 1954. Early fall arrival July 2, 1953, July 5, 1954. Late fall departure September 19, 1953.

Pectoral Sandpiper (*Erolia melanotos*). Uncommon migrant. One spring record April 27, 1954. Early fall arrival June 29, 1953.

Baird's Sandpiper (*Erolia bairdii*). Probably uncommon among the flocks of "peep" sandpipers. Sight record of one bird July 30, 1954, three observed August 2, 1954.

Least Sandpiper (*Erolia minutilla*). Three records: one bird April 25, two on August 6 (collected) and one August 3, 1954.

Red-backed Sandpiper (*Erolia alpina pacifica*). Two birds observed at very close range May 10, 1954, on a dune island in Potholes Reservoir. A single previous record for the east side of the Cascades; Piper collected one at Pullman November 3, 1901 (Hudson and Yocom, 1954).

Long-billed Dowitcher (*Limnodromus griseus scolopaceus*). Uncommon migrant; one spring record on May 24, 1954. Early fall arrival July 5, 1954, July 10, 1953.

Semipalmated Sandpiper (*Ereunetes pusillus*). A single record; about 12 were seen on Deadman Lake, Adams County, August 7, 1954.

Western Sandpiper (*Ereunetes mauri*). Abundant migrant. Early spring arrival April 24, 1954; late spring departure, May 13, 1954. Early fall arrival June 28, 1954, July 16, 1953. Several hundred observed along Crab Creek on July 14, 1954.

Avocet (*Recurvirostra americana*). Common summer resident and breeder in the potholes. Early arrival May 6, 1954.

Northern Phalarope (*Lobipes lobatus*). A single record, six observed July 5, 1954, near O'Sullivan Dam.

Long-tailed Jaeger (*Stercorarius longicaudus*). A single record, an adult collected June 27, 1953 on Potholes Reservoir; the first known record for this region. Specimen in Charles R. Conner Museum.

Glaucous-winged Gull (*Larus glaucescens*). Two records, adults at close range April 22 and May 4, 1954. As no specimens have been collected in this region Hudson and Yocom (1954) place the species on their hypothetical list.

Herring Gull (*Larus argentatus smithsonianus*). Uncommon. From four to six immature birds observed almost daily from May 5 to August 10, 1954. A single previous record for the region, Sloanaker collected one December 10, 1941 at Spokane (Hudson and Yocom, 1954). A specimen was collected May 5, 1954, to verify the record; now in Charles R. Conner Museum.

Ring-billed Gull (*Larus delawarensis*). Abundant summer resident and breeder on the dune islands of Potholes Reservoir. Early arrival February 15, 1954; late departure December 19, 1953. Egg dates from May 24 to July 10, peak of hatch mid-June.

Bonaparte's Gull (*Larus philadelphia*). Occasional migrant. Early arrival May 9, 1954; late spring departure May 30, 1954. Early fall arrival July 29, 1954; late fall departure November 14, 1953.

Forster's Tern (*Sterna forsteri*). A single record, May 13, 1954 (five birds).

Common Tern (*Sterna hirundo hirundo*). Two records, one bird August 5, 12 on August 11, 1954.

Caspian Tern (*Hydroprogne caspia*). Rare summer resident, nesting on dune islands in Potholes Reservoir during 1953. Early arrival May 13, 1954. Two nests with eggs in Ring-billed Gull colony June 28, 1953. Both nests found destroyed July 10 and adults deserted the area. No nesting observed in 1954, but three birds recorded July 30 and August 3.

Black Tern (*Chlidonias niger surinamensis*). Common summer resident and breeder in the potholes. Early arrival May 12, 1954. Nests with eggs May 24 to June 9, 1954.

Western Mourning Dove (*Zenaidura macroura marginella*). Common summer resident in the potholes and sagebrush areas. Early arrival April 9, 1954. Young almost able to fly June 10, 1954, and nests with eggs to August 10, 1953.

Northwestern Horned Owl (*Bubo virginianus lagophonus*). Resident and breeder in the Drumheller scabland channels, also observed in the potholes.

Western Burrowing Owl (*Speotyto cunicularia hypugaea*). Local summer resident near Moses Lake, not occurring in the potholes.

Long-eared Owl (*Asio otus wilsonianus*). Several summer records for the potholes.

Saw-whet Owl (*Aegolius acadicus acadicus*). A single record, one bird in the potholes on April 24, 1954.

Nuttall's Poor-will (*Phalaenoptilus nuttallii nuttallii*). Not found in the potholes, restricted to sagebrush areas. Early arrival (two miles southwest of Warden) May 8, 1954. Harris and Yocom (1952) found a nest near O'Sullivan Dam in 1950.

Pacific Nighthawk (*Chordeiles minor hesperis*). Common summer resident and breeder in the sagebrush, occasionally seen in the potholes. Early record June 16, 1954. Nest with eggs June 28, 1953.

Rufous Hummingbird (*Selasphorus rufus*). One record, July 25, 1953.

Western Belted Kingfisher (*Megascyle alcyon caurina*). One seen July 21, 1954 along Crab Creek. Greene has recorded the species several times below O'Sullivan Dam.

Red-shafted Flicker (*Colaptes cafer collaris*). Common breeding resident in the potholes and adjacent areas.

Batchelder's Downy Woodpecker (*Dendrocopos pubescens leucurus*). Permanent resident, observed along Crab Creek below O'Sullivan Dam.

Eastern Kingbird (*Tyrannus tyrannus*). Very common summer resident and breeder in the potholes. Early arrival May 15, 1954. Nests with eggs June 20 to July 29, 1954. Young able to fly July 31, 1953.

Western Kingbird (*Tyrannus verticalis*). Summer resident in sagebrush areas, only a single record for the potholes. Early arrival April 27, 1954.

Ash-throated Flycatcher (*Myiarchus cinerascens cinerascens*). Uncommon summer resident in the potholes and along Crab Creek. Early arrival May 22, 1954. Latest record August 7.

Yukon Say's Pheobe (*Sayornis saya yukonensis*). Uncommon summer resident in sagebrush, not found in the potholes. Early arrival March 10, 1954. Nest with young June 17, 1953.

Flycatcher (*Empidonax* sp.). Several records for the *Empidonaces* in the potholes, species uncertain. Early arrival April 22, 1954.

Horned Lark (*Eremophila alpestris*). Not found in the potholes, common in adjacent sage areas. (Subspecies probably *merrilli* or *lamprochroma*.)

Violet-green Swallow (*Tachycineta thalassina lepida*). Migrant in this area. Early spring arrival March 28, 1954; late spring departure April 19, 1954.

Tree Swallow (*Iridoprocne bicolor*). Migrant in this area. Early spring arrival March 28, 1954.

Bank Swallow (*Riparia riparia riparia*). Common summer resident, breeding. Early arrival April 20, 1954. Nests along the shore of Potholes Reservoir.

Rough-winged Swallow (*Stelgidopteryx ruficollis serripennis*). Fairly common summer resident, breeding. Early arrival March 26, 1954.

Barn Swallow (*Hirundo rustica erythrogaster*). Common summer resident, not breeding in the potholes. Early arrival April 24, 1954.

Cliff Swallow (*Petrochelidon pyrrhonota hypopolia*). Abundant summer resident and breeder below O'Sullivan Dam. Early arrival March 28, 1954.

American Magpie (*Pica pica hudsonia*). Common resident in the potholes and sagebrush areas.

American Raven (*Corvus corax sinuatus*). Uncommon resident in the potholes and sagebrush areas.

Western Crow (*Corvus brachyrhynchos hesperis*). A single record, March 15, 1954 (one bird).

Columbian Black-capped Chickadee (*Parus atricapillus fortuitus*). Permanent resident, not recorded in the potholes. Observed near Moses Lake several times.

Red-breasted Nuthatch (*Sitta canadensis*). Not seen in the potholes, one observation near Moses Lake.

Western Long-billed Marsh Wren (*Telmatodytes palustris plesius*). Uncommon summer resident in the potholes. Early arrival February 22, 1954. Nest with eggs June 25, 1953.

Common Rock Wren (*Salpinctes obsoletus obsoletus*). Common summer resident in the Drumheller scabland channels below O'Sullivan Dam. Early arrival February 25, 1954.

Catbird (*Dumetella carolinensis*). One seen July 9, 1954 below O'Sullivan Dam near Crab Creek; probably breeds along Crab Creek in small numbers.

Sage Thrasher (*Oreoscoptes montanus*). Uncommon summer resident, four records for the potholes May 30 to June 20, 1954.

Robin (*Turdus migratorius*). Common resident, apparently not breeding in the potholes.

Mountain Bluebird (*Sialia currucoides*). Not observed in the potholes, Greene recorded it February 10, 1954 along Crab Creek below O'Sullivan Dam.

Townsend's Solitaire (*Myadestes townsendi townsendi*). Uncommon winter visitor; early fall record November 14, 1953; late spring record May 7, 1954.

Western Ruby-crowned Kinglet (*Regulus calendula cineraceus*). Uncommon migrant; early arrival April 12, 1954; late departure May 10, 1954. No fall records.

Western Pipit (*Anthus spinoletta pacificus*). Common migrant, observed in the potholes and adjacent sagebrush. Spring records April 22 to 28, 1954. Fall records September 19 to November 14, 1953.

Northwestern Shrike (*Lanius excubitor invictus*). Uncommon winter visitor; late spring departure March 28, 1954 (Hudson).

California Loggerhead Shrike (*Lanius ludovicianus gambeli*). Common summer resident in sagebrush, not observed in the potholes. Early arrival March 10, 1954.

Starling (*Sturnus vulgaris vulgaris*). Introduced; common winter visitor and probably a local breeder in sagebrush, not observed in the potholes.

Oregon Warbling Vireo (*Vireo gilvus leucopolius*). A single spring record, May 6, 1954, near Crab Creek below O'Sullivan Dam.

Calaveras Nashville Warbler (*Vermivora ruficapilla ridgwayi*). Uncommon migrant, observed April 29 to May 6, 1954.

Rocky Mountain Yellow Warbler (*Dendroica petechia morcomi*). Migrant in the potholes, records from May 10 to 30, 1954.

Audubon's Warbler (*Dendroica auduboni auduboni*). Common migrant in the potholes area. Early arrival April 15, 1954; late spring departure May 13, 1954. Fall arrival September 20, 1953; fall departure October 3, 1953.

Northern Plains Yellowthroat (*Geothlypis trichas campicola*). Summer resident along Crab Creek in 1953, not recorded in 1954 after this area was inundated by Potholes Reservoir.

Long-tailed Chat (*Icteria virens auricollis*). Migrant, a single record for the potholes on May 10, 1954.

Northern Pileolated Warbler (*Wilsonia pusilla pileolata*). One record for the potholes, May 24, 1954.

English Sparrow (*Passer domesticus domesticus*). Not recorded in the potholes; abundant permanent resident throughout the region.

Western Meadowlark (*Sturnella neglecta*). Abundant resident, a few birds remaining in winter.

Yellow-headed Blackbird (*Xanthocephalus xanthocephalus*). Common summer resident in the potholes, breeding. Early arrival April 9, 1954. Nests with eggs May 24 to June 17, 1954.

Nevada Redwing (*Agelaius phoeniceus nevadensis*). Abundant summer resident, breeding in the potholes. Early arrival (males) February 15, 1954, (females) February 23, 1954. Nests with eggs from May 13 to June 20, 1954.

Bullock's Oriole (*Icterus bullockii bullockii*). Summer resident in the area, early arrival May 28, 1954. Juvenile birds noted July 13 and 14, 1954.

Brewer's Blackbird (*Euphagus cyanocephalus*). Abundant migrant and uncommon summer resident in the potholes. Early arrival March 26, 1954. Nests with eggs May 10 to June 10, 1954. Late departure November 14, 1954.

Nevada Cowbird (*Molothrus ater artemisiae*). One record for the potholes, June 30, 1954.

Western Tanager (*Piranga ludoviciana*). A single record, one observed August 7, 1954 below O'Sullivan Dam.

Pale Goldfinch (*Spinus tristis pallidus*). Permanent resident; frequently seen along Crab Creek below O'Sullivan Dam in February, not recorded in the potholes.

Nevada Spotted Towhee (*Pipilo maculatus curtatus*). Uncommon migrant along Crab Creek, not recorded in the potholes. Early spring arrival March 9, 1954; late spring departure May 6, 1954.

Nevada Savannah Sparrow (*Passerculus sandwichensis nevadensis*). Common migrant and breeding summer resident in the potholes. Early arrival March 11, 1954. Late spring departure September 19, 1953.

Western Vesper Sparrow (*Poocetes gramineus confinis*). Very common summer resident in the potholes, breeding. Early arrival March 19, 1954; late departure September 20, 1953. Nests with eggs from May 12 to August 7, probably raises two broods.

Western Lark Sparrow (*Chondestes grammacus strigatus*). Common summer resident in sagebrush, rarely observed in the potholes. Early arrival May 11, 1954.

Northern Sage Sparrow (*Amphispiza belli nevadensis*). Local summer resident in sagebrush, not observed in the potholes. Early arrival March 28, 1954 (Hudson).

Junco (*Junco oreganus*). Common winter visitor, late spring departure April 24, 1954.

Western Tree Sparrow (*Spizella arborea ochracea*). Winter visitor, observed along Crab Creek. Late spring departure March 10, 1954.



Brewer's Sparrow (*Spizella breweri breweri*). Common summer resident in the potholes. Early arrival April 14, 1954. Nest with eggs May 13, 1954.

Gambel's White-crowned Sparrow (*Zonotrichia leucophrys gambelii*). Common migrant in the potholes. Early arrival April 21, 1954; late spring departure May 8, 1954.

Golden-crowned Sparrow (*Zonotrichia atricapilla*). One record, two observed in a flock of White-crowned Sparrows near Warden, May 8, 1954.

Song Sparrow (*Melospiza melodia*). Common permanent resident along Crab Creek, uncommon in the potholes.

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August 24, 1954

Zoology Dept., Washington State College

#### GENERAL NOTES

##### *Early Nesting Record of the Long-eared Owl*

On March 6, 1952, the nest of a long-eared owl, *Asio wilsonianus*, containing five eggs was found by the writer in Crooked River canyon in Crook County, Oregon, near the Deschutes County line. The nest was in an old crows nest and situated in a willow tree, 20 feet above the canyon floor. Observation was made from a rimrock at a distance of 10 feet. An adult long-eared owl was flushed from the nest at the time of discovery.

Long-eared owls commonly nest in Oregon in late April and early May. This is an unusually early nest record.—CHESTER E. KEBBE, *Portland, Oregon*, August 16, 1954

##### *Two Waterfowl Species Not Previously Reported from the Klamath Lakes of Oregon*

Among some frozen birds recently sent me for specimens by a friend at Klamath Falls, Oregon, were two species of special interest that I believe should be placed on record.

Red-breasted Merganser (*Mergus serrator*). An adult female taken by T. Ganatt on Upper Klamath Lake, Klamath County, Oregon, on October 27, 1953.

Surf Scoter (*Melanitta perspicillata*). An adult female taken by Chet Langslet on Upper Klamath Lake on December 14, 1953.

Both the above birds were shot by duck hunters, and were secured by local game officers who recognized them as birds not seen in the Klamath Lake region. Both are the first that I know of taken east of the Cascade Mountains of Oregon, and both are now in the Jewett collection.—STANLEY G. JEWETT, *Portland, Oregon*, March 16, 1954

##### *Long-tailed Jaeger Collected in Eastern Washington*

An adult female Long-tailed Jaeger (*Stercorarius longicaudus*) was collected on Potholes Reservoir, Grant County, Washington, June 27, 1953. The bird was observed resting on the water near the middle of the reservoir, and as I approached, I noticed it was unable to fly. It attempted to fly several times as I came near, but seemed too exhausted to be able to leave the water. It was readily captured and brought to shore. Although in apparent good health, it refused to eat, and died that night. The bird was skinned, and is

specimen number 53-216 in the Charles R. Conner Museum, State College of Washington. No mention of this species is made by Jewett et al in *Birds of Washington State*, and the species is placed on the hypothetical list in Gabrielson and Jewett's *Birds of Oregon*.—PAUL A. JOHNSGARD, *State College of Washington, Pullman, Washington*.

## SOCIETY MEETINGS

## MEETING DATES

Dec. 27-29, 1954—Berkeley with A.A.A.S.  
Jan. 15, 1955—Seattle Game Department  
Feb. 19, 1955—Corvallis  
March 12, 1955—Tacoma, nominations  
April 2, 1955—Seattle, annual  
May 7, 1955—Moscow, Idaho

The Pacific Northwest Bird and Mammal Society held a regular meeting at Linfield College, McMinnville, Oregon, on Feb. 13, 1954.

The following were elected to membership:

Francis E. Marsh of McMinnville, Ore.  
Harry Schoenborn of Molalla, Ore.  
Mabel Schoenborn of Molalla, Ore.  
Phyllis Van Dermark of Portland, Ore.  
Dr. William O. Pruitt, Jr. of Fairbanks, Alaska, and

John H. Larsen, Jr. of Seattle reinstated to membership.

The following program was presented:  
*Deer Population Densities and Range Conditions in the Mt. Hamilton Range*, Dr. William Graf, San Jose State College. (Slides.)  
*Wintering Birds at Carlton Lake, Ore.*, Ed Taylor, Linfield College (Illus.).

*The Western Grebe*, U. S. Fish & Wildlife Service Color Movie, Dr. S. G. Jewett.

*General Operations of the Oregon State Game Commission*, P. W. Schneider, State Game Director.

*Wildlife and the Human Touch*, Wm. Huber, Head, Division of Wildlife & Grazing, U. S. Forest Service (Color Movie).

*River Boat Trip on the Owyhee*, color movie by Eugene and Francis Marsh, McMinnville.

*Banding Studies of Migratory Game Birds in Oregon*, C. E. Kebbe, Chief, Fur Resources & Waterfowl, Ore. State Game Commission.

*Introduction of the Eastern Cottontail Rabbit in Western Ore.*, Dr. Wm. Graf, San Jose State College (Slides).

*Wyoming Antelope Fawn*, C. D. Snow, Willamina, Oregon.

*Autos and Highway Deaths to Birds*, Ray Albright, Dayton, Ore.

*Restoration of Sea Otter and Big Horn Sheep in Oregon*, Tom McAllister, Outdoor Editor, the Oregon Journal.

*Natural History of the Lava Beds*, Dr. Ruth E. Hopson, Gen. Extension Division, Oregon State System Higher Education (color movie).

Respectfully submitted,  
BURTON T. OSTENSON  
Secretary

The Pacific Northwest Bird and Mammal Society held a regular meeting March 13, 1954 in Howarth Hall, College of Puget Sound, Tacoma. The minutes of the last meeting were read and accepted.

The following were elected to membership in the Society:

Harold O. Jorgenson of Fort Lawton, Wash.

L. D. La Fave of Spokane.

Leo Jobin of Williams Lake, B.C.

G. W. Cottrell Jr. of Cambridge, Mass.

The report of the Nominations Committee, Dr. George Hudson, chairman, was read and accepted.

Mrs. Zella Schultz described returns from Glaucous-winged Gulls banded on the San Juan Islands.

Dr. Gordon D. Alcorn gave a review of *Birds of Washington State* by Stanley Jewett and others.

Coleman Newman discussed the elk population of Olympic National Park and showed a series of slides on wildlife of the Park.

Following the meeting, coffee and doughnuts were served in the Biology Laboratory.

Respectfully submitted,  
BURTON T. OSTENSON  
Secretary

## BOOK REVIEW

*Biology and Life History of the Sagebrush Vole* by William B. James and Ernest S. Booth. Walla Walla College, Dept. of Biol. Sc., College Place, Wash. First published July 20, 1952. Revised Jan. 15, 1954.

This revised publication has corrected several deficiencies that occurred in the first version and now represents an excellent life history study; it stands out as a standard reference work on this genus of mammal.

It is very encouraging to note that a great

deal of effort was put forth to produce a revision that is wholly acceptable in its present form. The genuine wish to maintain a high plane of scientific endeavor is evident.

This speaks well for the authors and their institution and I am certain that we can anticipate future excellent publications.

MURRAY L. JOHNSON  
Puget Sound Museum of  
Natural History  
College of Puget Sound  
Tacoma, Washington

# THE MURRELET

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BY THE

PACIFIC NORTHWEST BIRD AND MAMMAL SOCIETY



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